

BROOKHAVEN NATIONAL LABORATORY

MEMORANDUM

DATE: April 16, 1997
TO: W. R. Casey
FROM: H. F. Kahnhauser 
SUBJECT: Report of the g-2 ARR Committee for Routine Operations

This report covers the routine operation of Fast Extracted Beam (FEB) through the V line and the g-2 V target blockhouse into the V target and beamstop in support of the research program. The Committee reviewed the following:

1. Open items from the May 2, 1996, g-2 ARR Report.
 - A. Resolution of the disagreement between the shielding design for environmental calculations and the "as built".
 - B. Determine if a proton limit needs to be established for the dump to ensure that AGS stays within its OSLs.
 - C. The NESHAPS evaluation needs to be updated with the most recent source term.
 - D. The results of the low intensity fault testing.
2. The status of the PASS for personnel protection for g-2.
3. Status of the operational procedures for g-2.
4. The closeout of the ORR g-2 Beam Line (Beneficial).
5. The potential of impact to ground water at the g-2 target and beam stop area.

The results of the review are summarized in the following sections. In summary, the ARR Committee concurs with the AGS Management that g-2 can commence routine operations upon completion of Ground Water Issues 5A and 5D, and management certification of the readiness of PASS for personnel protection. These items must be addressed, closed, and documented prior to commencing routine operations of g-2 this year. Items 5B, 5C, and 5E must be addressed and closed prior to next years operations. In addition, AGS must address the changes and upgrades installed on the other portions of the PASS. This modifications need to be installed after the 1997 running period.

1. Resolution of the Open Items from May 2, 1996 ARR Report:

- A. The apparent discrepancy in the designed dump and the "as built" dump was resolved the memorandum from E. Lessard to H. Kahnhauser of May 16, 1996, concerning an "Update on V Dump and V Target Environmental Calculations" and a review of the March 19, 1990, memorandum from E. Lessard to J. Naidu concerning "Planned Activation of Soil and Air at g-2 for NEPA Assessment".
- B. E. Lessard has made the case in his May 6, 1996 memo, for not needing a proton operational safety limit to be established for the dump.

- C. The NESHAPS evaluation was updated by E. Lessard in his memorandum of May 8, 1996, to G. Schroeder. The memorandum addresses the NESHAPS issues related to the description of the g-2 target "as built" design.
- D. The results of the g-2 fault study tests were provided by K. Reece, Chairman of the AGS Radiation Safety Committee. In light of the results from the fault tests, K. Reece has determined the appropriate chipmunk settings for detection of fault conditions that may produce abnormally high radiation fields.

2. Review of PASS:

The modules of the PASS used for the g-2 experiment are identified as the U, VT, V1, and Muon areas. The U area was tested and used previously for AtR commissioning, but for g-2 this area is in a different mode, delivering beam to the V target rather than to the RHIC transport line. All four areas have been tested for g-2 operation and certification of this safety system is near completion.

This certification process has been the subject of reviews by the PASS subcommittee of the RHIC/AGS Radiation Safety Committee. Testing revealed problems which were deemed unacceptable for g-2 operation, and were corrected by changes in the PASS software. The process of determination of the nature of the required changes, the review of the software changes, and the retesting after completion all were thorough and competent as revealed by discussions in the subcommittee. The documentation and approvals of the system also appear to be according to RHIC/AGS standards and procedures, and a declaration from RHIC/AGS management that the system is ready to provide protection for g-2 operation should satisfy ARR requirements.

There are still minor discrepancies in the system which do not impact protective functions but which should be corrected. Also, upgrades which were included in the portions of PASS used in the RHIC Sextant test were not done on the g-2 part of the system. These changes should be listed as Post-Startup items; however, the Committee finds that the PASS can provide adequate personnel protection for g-2 routine operations.

3. Status of the Operational Procedures:

The Committee has received copies of the operational procedures for the V target and the g-2 Radiation Safety Checkoff List for V-Line and V1 Line Operation. AGS has decided that they will maintain their operational procedures as TPLs rather than making them permanent until the next running period. All procedures have been reviewed and approved by AGS management and training completed as certified by E. Lessard on April 9, 1997.

4. ORR g-2 Beamline (Beneficial):

The ORR of g-2 was performed by H. Schulman et. al., on March 29, 1996. All g-2 open items have satisfied with concurrence from H. Schulman.

5. Potential Impact to Ground Water:

In his memorandum, D. Paquette to H. Kahnhauser, April 16, 1997, Mr. Paquette reports on his review of the g-2 source term for activation and the potential impact of g-2 beam dump on the soil and ground water. Mr. Paquette has several recommendations that need to be addressed by Brookhaven National Laboratory and AGS management. They are summarized as follows:

- A. Before commencing 1997 operations, adequate engineering controls need to be put into place to prevent rain water from infiltrating the soils surrounding the beam dump. It is noted that AGS has spread waterproof tarps over the beam dump; however, they appear undersized and are probably ineffective in preventing significant rainwater infiltration. The "tarp" system needs to be enlarged to ensure adequate protection.
- B. After the May-June run of g-2, AGS must engineer a permanent impermeable cover to be installed. This cover must meet the requirements set by the SEP Environmental Compliance Section as being equivalent to that used for a landfill.
- C. In addition to the engineering controls, ground water monitoring wells must be installed to verify that the engineering controls are effective and to verify soil activation calculations/assumptions. It is our understanding that the wells would be installed after the current running period but before the next running period for g-2. The locations and number of wells will be dependant upon the results of the "Ground Water Vulnerability Report" to be issued by SEP.
- D. Assuming that the engineered barriers are not 100% effective, a realistic prediction of the radiological source term, potential radionuclide concentrations in soils, and potential groundwater impacts should be evaluated by Brookhaven National Laboratory Management and the DOE (and possibly the regulatory agencies as appropriate).
- E. A site specific ground water model should be utilized as part of the analysis.

ARR Members:

D. Beavis *DB*
T. Dickinson *TD*
J Eckroth *JE*
L. Snead *LS*

cc: M. S. Davis
D. Lowenstein
E. Lessard

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